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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/008,392

11/13/2001

Ioannis Pavlidis

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07/16/2004

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EXAMINER

JAGAN, MIRELLYS

ART UNIT

PAPER NUMBER

2859

DATE MAILED: 07/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/008,392

Applicant(s)

PAVLIDIS, IOANNIS

Examiner

Mirellys Jagan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 41, 43, 44 and 49-55 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-8, 12-19, 23, 25-27, 30, 32-40, 45-48 and 56-59 is/are rejected.
- 7) ☒ Claim(s) 3, 9-11, 20-22, 24, 28, 29, 31 and 42 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/13/01 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 8/29/03 was considered by the Examiner. A signed copy of the IDS was returned to Applicant in the Office action mailed 12/31/03.

Claim Objections

2. Claims 1-11 and 23-29 are objected to because of the following informalities:

In claims 1 and 23, "based on the" should be changed to --of the-- in lines 7 and 9, respectively, since line 3 of claim 1 and line 4 of claim 23 state that the frames are 'of' the thermal image data and not 'based on' the thermal image data.

In claim 2, it is not clear if the 'change in blood flow rate over time' claimed in lines 2-3 is referring to the same blood flow rate that is calculated in claim 1, i.e., the change of blood flow rate over the plurality of frames.

In claim 42, it is not clear if the 'change in blood flow rate over time' claimed in lines 2-3 is referring to the same blood flow rate that is used in the model of claim 41, i.e., the change of blood flow rate that is inversely proportional to the square of skin temperature deviation from a core temperature.

Claims 3-11 and 24-29 are objected to for being dependent on an objected base claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 12-19, 36-40, 45-48, and 56-59 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,603,328 to Zucker et al [hereinafter Zucker].

Zucker discloses a system comprising:

a thermal IR imaging device operable to provide a plurality of frames of thermal image data of at least a region of a face of a person; provide thermal image data of at least a region proximate an eye of a person; provide thermal image data of more than one region of the face of a person; and capture thermal image data during at least a period of time during an elicited response from a person; and

a computing apparatus operable to transform the thermal image data to blood flow rate data for use in determining whether a person is deceptive or non-deceptive by calculating a change of blood flow rate over the plurality of frames; classify the person as deceptive or non-deceptive based on a change in blood flow rate over time; transform the thermal image data using a thermodynamic model where change of blood flow rate is inversely proportional to the square of skin temperature deviation from a core temperature of a human body; determine whether a person is deceptive or non-deceptive based on the blood flow rate data corresponding to the thermal image data captured during the response; determine a physiological state of the

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person based on the blood flow rate data; and operable to track movement of at least the region during a period of time using a video camera.

Furthermore, the term "operable" is defined as 'practicable', which is defined as 'capable of being used' (see Webster's Dictionary, 10th ed.), and is therefore not a positive limitation since it only requires the ability to so perform. In this case, the image device and the computing means of Zucker are 'operable' to perform the claimed functions since the image device is capable of imaging a region of a face or any other body part and the computing device is capable of being programmed by a user to perform the claimed functions, if so desired.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 4-8, 23, and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zucker in view of U.S. Patent 5,507,291 to Stirbl et al [hereinafter Stirbl].

Zucker discloses a method for monitoring blood flow rate of any region of a human body, the method comprising:

providing a plurality of frames of thermal image data, i.e., thermally imaging over time, of any region or regions of a human body by focusing a thermal IR imaging device operable to provide thermal image data on the region or regions of the body of the person; capturing the

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frames over a period of time, and providing a video camera, which tracks movement of the region(s);

transforming the thermal image data to blood flow rate information by calculating a change of blood flow rate over the plurality of frames, i.e. calculating the blood flow rate over time; and

determining a physiological state of the person based on the blood flow information.

Zucker does not disclose the particular body part being the face of a person or a region proximate the eye of a person; and using the calculated blood flow rates to determine if the person is deceptive or non-deceptive.

Stirbl discloses a device for monitoring physiological parameters of a person. Stirbl discloses that a person's blood flow rate is useful for medical purposes, such as diagnosing a medical condition, as well as for determining the truthfulness of a person's response to a question by correlating the blood flow rate during the response to a pressure value, which is used to determine stress or lying (see column 1, lines 108-39; column 5, line 63-65).

Referring to claims 1 and 23, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method disclosed by Zucker by obtaining thermal images of the face of a person or a region proximate the eye of the person in order to determine blood flow information for a desired facial region of the person to diagnose a condition in that region, if so desired by a user.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method disclosed by Zucker by using the calculated blood flow rates to determine the truthfulness of a person as taught by Stirbl since Stirbl teaches

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that a person's blood flow rate is useful for medical purposes as well as for determining the truthfulness of a person, if so desired by a user.

7. Claims 30 and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zucker.

Zucker discloses a method for monitoring blood flow rate of any region of a human body, the method comprising:

providing a plurality of frames of thermal image data, i.e., thermally imaging over time, of any region or regions of a human body by focusing a thermal IR imaging device operable to provide thermal image data on the region or regions of the body of the person; capturing the frames over a period of time, and providing a video camera, which tracks movement of the region(s);

transforming the thermal image data to blood flow rate information by calculating a change of blood flow rate over the plurality of frames, i.e. calculating the blood flow rate over time; and

determining a physiological state of the person based on the blood flow information.

Zucker does not disclose the particular body part being the face of a person or a region proximate the eye of a person.

Referring to claims 30 and 32, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method disclosed by Zucker by obtaining thermal images of the face of a person or a region proximate the eye of the person in

order to determine blood flow information for a desired facial region of the person to diagnose a condition in that region, if so desired by a user.

Allowable Subject Matter

8. Claims 3, 9-11, 24, 28, and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and amended to overcome the objections set forth in this Office action.
9. Claims 20-22 and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
10. Claims 41, 43, 44, and 49-55 are allowed.
11. Claim 42 would be allowable if amended to overcome the objections set forth in this Office action.
12. The following is a statement of reasons for the indication of allowable subject matter:
The prior art of record does not disclose or suggest the following in combination with the remaining limitations of the claims:
A method for use in detecting deception of a person, the method comprising:

transforming the thermal image data using a thermodynamic model where the change in blood flow rate is inversely proportional to the square of skin temperature deviation from a core body temperature of a human body (see dependent claim 3); or

providing measurement of at least one physiological parameter that is different from the change of blood flow rate, wherein determining if a person is deceptive or non-deceptive is based on the change in blood flow rate and the at least one physiological parameter (see dependent claim 9).

A system for use in detecting deception of a person, the system further comprising means for providing measurement of at least one physiological parameter that is different than the change of blood flow rate data obtained using the thermal image data (see dependent claim 20).

A polygraph method for use in determining whether a person is being deceptive or non-deceptive with respect to a response elicited from the person, the method comprising:

transforming the thermal image data using a thermodynamic model where the change in blood flow rate is inversely proportional to the square of skin temperature deviation from a core body temperature of a human body (see dependent claim 24); or

providing measurement of at least one physiological parameter that is different from the change of blood flow rate, wherein determining if a person is deceptive or non-deceptive is based on the change in blood flow rate and the at least one physiological parameter (see dependent claim 28).

A method for use in monitoring blood flow rate, the method comprising transforming the thermal image data using a thermodynamic model where the change in blood flow rate is

inversely proportional to the square of skin temperature deviation from a core body temperature of a human body (see dependent claim 31).

13. The following is an examiner's statement of reasons for allowance:

The prior art of record does not disclose or suggest the following in combination with the remaining limitations of the claims:

A method for use in detecting deception of a person, the method comprising transforming the thermal image data to blood flow rate data, wherein transforming the thermal image data comprises transforming the thermal image data using a thermodynamic model where the change in blood flow rate is inversely proportional to the square of skin temperature deviation from a core body temperature of a human body (see independent claim 41).

A polygraph method for use in determining whether a person is being deceptive or non-deceptive with respect to a response elicited from the person, the method comprising the step of transforming the thermal image data to blood flow rate data by transforming the thermal image data using a thermodynamic model where the change in blood flow is inversely proportional to the square of skin temperature deviation from a core body temperature of a human body (see independent claim 49).

A method for use in monitoring blood flow rate, the method comprising the step of transforming the thermal image data to blood flow rate information, wherein transforming the thermal image data comprises transforming the thermal image data using a thermodynamic model where the change in blood flow rate is inversely proportional to the square of skin

temperature deviation from a core body temperature of a human body (see independent claim 51).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

14. Applicant's arguments with respect to claims 1-59 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents and publications disclose thermal imaging means:

U.S. Patent 5,287,183 to Thomas et al

U.S. Patent 6,757,412 to Parsons et al

U.S. Patent Application Publication 2003/0204144 to Lin

U.S. Patent Application Publication 2003/0120140 to Bango, Jr.

U.S. Patent Application Publication 2003/0016726 to Pavlidis

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16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mirellys Jagan whose telephone number is 571-272-2247. The examiner can normally be reached on Monday-Friday from 9AM to 4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJ
July 13, 2004



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